

THE ARNOLD ARBORETUM DURING THE FISCAL YEAR ENDED JUNE 30, 1933

THE YEAR 1932-33 proved favorable to the growth of all collections in the arboretum and fruticetum. Late in February a heavy snow-fall caused considerable damage to Junipers, Spruces and small deciduous trees.

Four hundred forty-two plants were added to the collections; these were taken from the Arborway nursery.

Exchange of plants, cuttings, scions and seeds were continued and during the year 798 cuttings and scions, 2213 plants and 817 packets of seed were sent out. There were received from institutions in this country, Canada, Europe and Australia 1091 packets of seed, 1556 plants and 158 cuttings and scions.

Eleven hundred and thirty visitors registered at the Administration Building. Thirty-seven states in the Union were represented and also British Columbia, Nova Scotia, France, Switzerland, Holland, Germany, England, Ireland, China, Japan, Philippine Islands and Australia.—
L. V. S.

Pathological Laboratory.—The Arboretum's research laboratory in Plant Pathology submits its report for 1932-3, making reference to certain new diseases, extension services and investigative activities.

One of the important functions of the pathologist's office is to advise of diseases that loom on the horizon, that is, of potentially devastating diseases which once established would entail heavy losses and constant warfare. An example of what the Arboretum has done in this connection is afforded by the warnings broadcast and the testing of effective control measures against the beech bark disease, a scourge that has within the last decade destroyed a high percentage of the beech trees in the adjacent Maritime Provinces and now is advancing into Maine. The predisposing factor of the disease, a bark-infesting insect similar to the woolly aphis, was discovered about four years ago by Mr. John Ehrlich of this laboratory to be sporadically distributed throughout metropolitan Boston. Subsequently, it was located elsewhere in eastern Massachusetts by other observers. Through the united efforts of the Arboretum and the Park Department it has been largely eradicated within the Boston area.

Two other diseases now demand notice, one an affection of Firs known as the "Gout disease," the other of Elms, the so-called "Dutch elm disease." The former was pointed out to me in Nova Scotia in 1929 by the Provincial Forester, Mr. Otto Schierbeck. Quoting from the Journal of the Arboretum, XI: 57. 1930 (Faull, J. H.: Notes on Forest Diseases in Nova Scotia)—"Standing out as perhaps most interesting of all is a widespread condition of Balsam Fir, involving practically all of the trees of entire stands, what I would designate for want of a better term as 'Gout.' The trees are stunted, the trunks taper rapidly and never reach normal height, the joints are very much swollen and the twigs in general are thickened and tend to be deflexed." To this might now be added that many trees are soon killed outright and others are grossly mis-shapen. At that time the etiology was not known, nor was it certain that a contagium was responsible. Through the researches of Mr. R. E. Balch of the Dominion Entomological Branch it has recently been determined that the cause is a bark insect of the woolly aphis type. In a recent eastern trip I observed that spread has been rapid and destruction extensive. It is found at present as far south as Brunswick, Maine. I am informed by Mr. H. B. Peirson, Entomologist for the State of Maine, that control is entirely practical in ornamentals by use of a contact insecticide. It is known to attack *Abies balsamea*, *A. arizonica*, *A. Fraseri*, *A. nobilis*, *A. glauca*, *A. sibirica* and certain other Firs.

Dutch elm disease is an even more serious malady because among the highly susceptible hosts is our much-beloved and widely-grown American Elm. From tests made in Holland on plants supplied by the Arboretum, Dr. C. Buisman has demonstrated that the American Elm is among the most vulnerable of the Elms. This disease is wide-spread throughout Europe and it has worked havoc there. Three years ago a few cases were discovered in Cleveland and one in Cincinnati; they were promptly extirpated. Report this year comes of an outbreak in New Jersey and southern New York which appears to be of much more serious proportions. The Arboretum is intensely interested in the problems of this and other elm diseases and will participate so far as its resources permit in efforts towards their solution.

The extension work of the laboratory, though more or less incidental to its main purpose, has continued to grow. A great many inquiries are received, and these are generally accompanied by specimens for diagnosis. To care for this phase of our work the necessity for adequate assistance in the laboratory, especially during the growing sea-

son, is a matter of importance. While much of the material that comes in to us can be readily disposed of, frequently more or less critical material is received that requires extended attention. Particularly has this been the case this year because of uneasiness among so many of our correspondents regarding the possibility of the presence of the Dutch elm disease, the certain diagnosis of which involves rather tedious laboratory technique. Consultation is welcomed, partly because of service that may be rendered, but also because unusual problems through this medium are from time to time disclosed.

The research undertakings of the laboratory have materially advanced during the year, yielding results of scientific interest and of economic application. A summary follows.

Professor J. H. Faull, continuing his studies on the rust fungi that attack conifers, has added to the literature a monograph on the hitherto little understood genus *Milesia* (Contributions from the Arnold Arboretum, No. II). These curious rusts, so far as has been determined, alternate between Firs and ferns. The monograph rectifies the tangled nomenclature, outlines the geographical distribution of species of *Milesia*, the world over, describes thirty-three species and two varieties, delineates thirteen new species and varieties, and records for the first time the life histories of three species of the nine whose life cycles are now more or less completely known.

Dr. K. S. Chester, on leave of absence in Europe on a Sheldon Fellowship for nine months of the year, has continued to publish on his work on precipitation reactions—on a biochemical analysis of these reactions and on the question of acquired reactions due to grafting. Most of his time has been devoted to an investigation of bacteriophage in relation to crown gall.

Dr. John Ehrlich has brought to a conclusion his immediate studies in America on the "beech bark disease" to which reference was made above. He now goes to Europe on a National Research Fellowship to study the problem at its original sources.

Miss L. M. Hunter has advanced her studies on the spermogonia of coniferous rusts and will continue her problem in Europe during 1933-4 supported by a traveling Fellowship.

Mr. I. H. Crowell has completed two years of intensive investigation on the Gymnosporangium rust diseases of *Juniperus* and the various Pomaceae other than Hawthorns. This work has been jointly supported by Dr. and Mrs. Henry Lyman and the Arboretum. Mr. J. D. MacLachlan is making parallel studies on *Juniperus* and the Hawthorns.

Mr. A. B. Hatch has devoted himself to a study of the mycorrhizae of Pines. He has made a notable contribution to the technique employed in the investigation of the biology of these remarkable structures and has published the first adequate account of the mycorrhizae of the White Pine. His investigations are conducted jointly under the auspices of the Harvard Forest and the Arboretum and have been made possible through the liberal generosity of an anonymous benefactor. — J. H. F.

Cytological Laboratory.—During the past year the cytological investigations have covered a wide field, including considerable work on the mechanism of chromosome pairing and division, as well as the cytological analysis of various families and genera from the standpoint of relationships and origins. An analysis of the mechanism of crossing over was presented before the International Genetics Congress and will appear in the Proceedings.

The behavior of segmental interchange chromosomes in *Tradescantia* has been studied and the results published in *Genetics*. A detailed study of chromosome pairing in *Larix* was completed by Mrs. Sax and published in *Genetics*. Mr. O'Mara completed his work in chromosome division in the pollen tube of *Lilium* and it has been published in the *Botanical Gazette*. Dr. Dermen's work on the origin and behavior of the nucleolus has been completed. A study of chromosome pairing in *Paeonia* has thrown some light on the mechanism of chromosome association.

Cytological work in connection with species and generic relationships has been completed for *Yucca* and *Agave*, *Ulmus*, *Cornus*, *Acer*, *Magnolia* and a considerable number of conifers. *Yucca* and *Agave* seem to be more closely related than the taxonomic grouping would indicate, but Dr. Dermen's work on *Cornus*, Mr. Foster's work on *Acer*, the chromosome numbers found in *Ulmus* and *Celtis*, the results obtained in the conifers by Mrs. Sax, and Dr. Whitaker's work on *Magnolia* and related genera all show a close correlation between chromosome characteristics and taxonomic grouping. Closely related families often have similar chromosomes. In the conifers most genera are different in chromosome morphology, but species within each genus have similar genomes.

The cytology of hybrids between Old and New World species have been studied in species hybrids of *Larix*, *Platanus* and *Campsis*. The *Larix* and *Platanus* hybrids are completely fertile and the *Campsis*

hybrid partially fertile, even though the original parental species in each case are morphologically distinct, and have been isolated from each other for very long periods of time.

Breeding work has been continued with Roses, Lilies and conifers. Crosses have also been tried between different genera of Pomoideae, some of which seem to be successful. In general the breeding work has been confined to crosses between closely related species. — K. S.

The Herbarium.—During the past fiscal year 16,377 mounted specimens have been added to the herbarium, bringing the total number up to 374,880 specimens. Of these accessions approximately 3800 came from the United States and Canada, 4000 from Central and South America inclusive of Mexico, 600 from Europe and western and central Asia, 1900 from eastern Asia, 1700 from southern Asia and Malaysia, 1200 from Africa, 2400 from Australasia and 400 were cultivated plants.

Among the more important collections received during the year the following may be mentioned: 3400 specimens collected by J. and M. S. Clemens on Mount Kinabalu, Borneo; 1270 specimens from Lingnan University collected chiefly in Hainan and southeastern China; 1100 specimens from H. H. Chung, Wuhan University, collected mostly in Fukien and Hupeh; 3350 South American specimens from the U. S. National Herbarium including a large number of Argentine plants collected by Venturi; also from the U. S. Herbarium 270 specimens collected by J. F. Rock in Yunnan and Burma; about 1000 numbers of Australian specimens collected by C. T. White, S. F. Kajewski and L. J. Brass; nearly 1000 numbers with about four sets of duplicates of plants from the Solomon Islands collected by L. J. Brass; 950 specimens of Kweichow plants from the University of Nanking; 900 specimens comprising 18 fascicles of the Herbarium Florae Rossicae from the Botanical Institute in Leningrad; 600 Brazilian plants collected by B. A. Krukoff; 575 plants from Colombia collected by A. E. Lawrence; over 550 plants from Trinidad collected by W. E. Broadway, 650 South African plants collected by F. A. Rogers; 1500 specimens chiefly from Indochina and Madagascar received from the Museum of Natural History at Paris; 195 specimens from Indochina collected by R. W. Squires.

To the fruit collection 370 specimens were added bringing the number up to 7815.

Additions of 451 specimens were made to the wood collection bringing the total up to 2816.

The collection of negatives of types and other important herbarium specimens consists now of 2524 negatives; 667 having been added, mostly types of Chinese species taken by the Curator in European herbaria.

Besides constantly using the herbarium in the determination of plants sent in for identification and also in the determination of large collections chiefly from eastern Asia and North America members of the staff have engaged in special work; Mr. E. J. Palmer is continuing his studies in the genus *Crataegus*; Dr. I. M. Johnston has published extensive notes on the Boraginaceae of the western United States; Mr. A. Rehder is continuing the revision of the ligneous plants described by H. Léveillé from Eastern Asia and Mrs. Susan D. McKelvey her studies in the genus *Yucca*. Among the visitors who have worked in the herbarium may be mentioned Dr. Shun Ching Lee of the National Normal University, Peiping, China, who has spent five months here in the preparation of a work on the forest trees of China, Dr. R. E. Woodson, Jr., of the Missouri Botanic Garden studied Apocynaceae and Mr. E. H. Walker, of the National Herbarium, Washington, Chinese Myrsinaceae; also Dr. L. H. Bailey of Ithaca, Dr. L. Diels, director of the Berlin Botanic Garden, Dr. S. F. Blake, Mr. W. W. Eggleston and Paul Russell of the Department of Agriculture, Washington, and Dr. A. Gundersen of the Brooklyn Botanic Garden consulted the herbarium.

For study outside the Arboretum herbarium 586 specimens were lent to 18 institutions and individuals in this country, Europe and China.

There have been distributed 14,536 specimens to 38 institutions in the United States, Canada, Europe, Asia, Africa and Australia.

Botanical exploration by members of the staff or by expeditions partly or wholly financed by the Arnold Arboretum has been carried on in both Americas, Eastern Asia and Australasia.

Dr. H. M. Raup and Mr. E. C. Abbe started in June 1932, as mentioned already in the last report, on a tour of botanical exploration of the Peace River region in the Canadian provinces of Alberta and British Columbia with financial aid from the National Research Council along with the support of the National Museum of Canada; they returned toward the end of September, having collected about 6400 specimens representing 1200 numbers. An account of the flora of this region has been prepared by Dr. Raup and will be published as No. VI of the Contributions from the Arnold Arboretum.

Professor J. G. Jack spent the time from the end of January to the beginning of April at the Atkins Institution of the Arnold Arboretum

at Soledad, Cuba, and collected in the neighborhood of Soledad and Cienfuegos about 600 numbers with many duplicates and with fruit and wood specimens.

Dr. I. M. Johnston left for England in October under a fellowship of the Guggenheim Foundation, chiefly to continue his work on the Boraginaceae and to study type specimens and other material of South American plants at Kew and the British Museum. In February he went to the Continent and worked first in Berlin and later in Paris.

Mr. Alfred Rehder spent the time from the end of June to the end of September in Europe for the purpose of examining and photographing type specimens of plants of China and the adjoining regions. He took about 600 photographs of types and critical specimens in the herbaria at Kew, the British Museum, Berlin, Florence, Geneva and Paris.

In China botanical expeditions of three institutions have had the financial support of the Arnold Arboretum. The southern province of Kwangsi, botanically as yet very little known, is being explored by an expedition from the University of Nanking under the direction of Dr. A. N. Steward. The Fan Memorial Institute of Biology at Peiping has, since spring 1932, an expedition collecting in the less well known parts of Yunnan; it also maintains an expedition in cooperation with the Academy of Science of Western China in Szechuan, which collected during 1932 about 2500 specimens and is in the field again this year under the direction of Dr. H. H. Hu. Lingnan University had under the direction of Dr. F. P. Metcalf during the second half of last year and the first half of this year an expedition in the field collecting in Hainan and Kwangtung which had up to the end of last year collected about 2125 numbers; another expedition started in January for Kwangsi and will remain there until July.

In the Solomon Islands Mr. L. J. Brass, who had already collected for the Arnold Arboretum in New Guinea from 1925 to 1926, continued the work of S. F. Kajewski and visited during the time from July 1932 to the beginning of January 1933 San Cristobal and Ysabel Island and also several smaller islands; he collected nearly 1000 numbers with approximately four sets of duplicates. In February he joined the Archbold Expedition to New Guinea.

In the summer of 1932 Dr. C. Regel, Director of the Botanic Garden at Kaunas, Lithuania, undertook a collecting tour to Asia Minor, partly financed by this Arboretum. Owing to the attitude of the Turkish authorities this trip was not very successful.

From April to the end of June 1932 Professor J. Bornmüller of Weimar made a successful collecting tour to Tripoli, Sicily and southern Italy with financial help from the Arnold Arboretum. — A. R.

The Library.—At the end of June 1933 the Library comprised 40,919 bound volumes, 10,085 pamphlets and 16,898 photographs, a gain of 271 volumes, 200 pamphlets and 112 photographs during the year. The increase, due to conditions, was smaller than in previous years but, nevertheless, presents an interesting breadth of inclusion, and more time could be given to analyzing important articles from periodicals and other works, thus enriching the material easily available.

Though few photographs have been added, the use of the collection has been extensive. Nearly 100 prints have been made and sold for nursery catalogues, post cards, publications, and collections institutional and private. Eleven photographs of Lilies were loaned to the Royal Horticultural Society of London for the Lily Conference. Eighty-eight prints of photographs taken in China by the late Dr. E. H. Wilson were made for Dr. Shun Ching Lee of Peiping, China, besides prints made for our own publications, and many photographs were used in lectures given by members of the staff. Eight colored slides reproduced from photographs in the collection have been added to the lantern slide collection and seven slides were made for the New York State College of Forestry. Slides used during the year number over 300.

Cards filed during the year include 737 in the card catalogue of books in the Library, 119 in the catalogue of photographs, 4,598 in the "Card-index of New Genera, Species and Varieties published by the Gray Herbarium," and 4,900 in the manuscript "Index of Illustrations and of New Genera, Species and Varieties of Ligneous Plants published since 1915," prepared at the Arboretum, bringing the total number of the latter to 97,639.

A very large amount of time has been spent in reading proof for the "Catalogue of the Library of the Arnold Arboretum of Harvard University, Volume iii, Serial Publications—Authors and Titles, Supplement, 1917-1933," which has now reached completion and is ready for distribution. It comprises 346 pages and approximately 17,300 entries arranged alphabetically, with numerous references. Nearly 900 slips have been filed for entries received too late for inclusion in the printed Catalogue and 300 slips for a supplement to the "Subject Catalogue," which is now in preparation.

Volumes bound number 113, as against 570 of last year, and nearly 100 smaller books and pamphlets were put into pamphlet binders.

Clipping files and scrap-books, with references in the card catalogue, bring together and preserve much interesting and valuable material which would otherwise be lost.

A large number of visitors have registered in the Library during the year. Dr. Shun Ching Lee of the National Normal University, Peiping, China, spent several months studying the forest trees of China. Professor L. H. Bailey and Miss Ethel Zoe Bailey, of Ithaca, New York, Mr. E. H. Walker, of the Smithsonian Institution, Dr. S. F. Blake and Mr. Paul Russell of the United States Department of Agriculture, Dr. R. E. Woodson, Jr., of the Missouri Botanical Garden, Dr. Conway Zirkle of the University of Pennsylvania, and Miss Elsie Jack of Hatzic, British Columbia, spent some time consulting the Library. Among other visitors were Mr. Frederick A. Delano to whom the Library owes its fine collection, previously described, of Chinese paintings of fruits and flowers, Dr. David Fairchild of Cocoanut Grove, Florida, and Mr. and Mrs. Arthur B. Spingarn of Amenia, New York.

The publications of the Arboretum, the "Journal of the Arnold Arboretum" and the "Arnold Arboretum Bulletin of Popular Information," were issued regularly; of the "Contributions from the Arnold Arboretum of Harvard University" numbers II-IV were published during the year. Of the approximately 400 periodicals that come to the Library from all parts of the world, nearly 250 were received in exchange for these publications.

More than 50 new periodicals have been received during the year, a large number in exchange for our publications and for herbarium specimens, some by gift and a number by purchase. They include:

AALSMEER—*Vereeniging tot oprichting en instandhouding van den proeftuin*. Jaarverslag. 1931. Aalsmeer. 1932.

AMERICAN civic annual. Vol. i-iv. Washington. 1929-32.

AMERICAN nurseryman. Vol. lvii, no. 2 → Rochester. 1933 →

AMERICAN orchid society bulletin. Vol. i, no. 1 → Washington. 1932 →

AMERICAN rose magazine. Vol. i, no. 1 → Harrisburg, Pa. 1933 →

BOLETIN de pro-cultura regional, S. C. L. Tom. i, n. 1-24, 28-30. Mazatlan. 1929-32.

BULLETIN of applied botany, of genetics and plant-breeding. Ser. A. Socialistic plant-industry. No. 1 → Leningrad. 1932 →

- BULLETIN of applied botany, of genetics and plant-breeding. Ser. ii. Genetics, plant-breeding and cytology. No. 1 → Leningrad. 1932 →
- FIELD museum news. Vol. ii, no. 10, 12; iii, 1-3, 5-11; iv, 1 → Chicago. 1931 →
- FLORALIA. Vol. liv, no. 13 → Haarlem. 1933 →
- FOREST log. Vol. i, no. 10-12; ii, 1; iii, 2 → Salem, Oregon. 1931 →
- FORTSCHRITTE der botanik. Bd. i, 1931. Berlin. 1932.
- GARDEN lover. Vol. ix, no. 1 → Melbourne; Sydney. 1931 →
- HARVARD UNIVERSITY—*Farlow herbarium of cryptogamic botany*. Contributions. Vol. [i] → Boston, etc. 1883 → (Incomplete)
- HEMLOCK ARBORETUM at "Far Country." Bulletin. No. 1 → Germantown, Pa. 1932 →
- IDAHO forester. Vol. xiii → Moscow, Idaho. 1931 →
- KAKTEEN-KUNDE. Heft 1 → Berlin. 1933 →
Forms new series of "Monatsschrift der Deutschen kakteen-gesellschaft."
- KAUNAS—*Universitas Vytauti Magni—Hortus botanicus*. Scripta. Tom. i → Kaunas. 1931 →
- KIVU—*Laboratoire des produits végétaux et de l'herbier du Service forestier*. Communications. No. 1 → Bruxelles. 1930 →
- LENINGRAD—*Akademiya nauk—Byuro po evgenike*. Izvestiya. No. 1-9. Petrograd. 1922-32.
- MAKILING echo. Vol. xi, no. 2, 4. Laguna. 1932.
- MINNESOTA studies in plant science. No. 1 → Minneapolis. 1932 →
- NATIONAL nut news. Vol. xv, no. 1 → Chicago. 1932 →
- REVISTA española de biología. Tomo i, cuaderno 1 → Madrid. 1932 →
- REVUE agrologique et botanique du Kivu. No. 1 → Bruxelles. 1932 →
- SAGHALIEN CENTRAL EXPERIMENT STATION. Reports. Ser. 2. Forestry. No. 1 → Konuma. 1932 →
- SOCIEDAD ESPAÑOLA DE HISTORIA NATURAL. Reseñas científicas. Tom. vi, num. 1 → Madrid. 1931 →
- TAIHOKU—*Imperial university—Faculty of science and agriculture*. Annual report of the Taihoku botanic garden. No. 1 → Taihoku. 1931 →
- TOKYO bunrika daigaku. Science reports. Section B. Vol. i, no. 4-10. Tokyo. 1932.
- WARSAW—*Université—Institut de botanique systématique et de phytogéographie*. Publications. No. 2, 6, 7, 10, 12, 13, 15-17, 19, 20, 22-25, 27 → Cracovie, etc. 1927 →

On November 8, 1932, fifty-five periodical titles were sent for publication in the "Union List of Serials."

Among other important accessions are:

AMES, Mrs. Blanche Ames. Genera of the Gymnospermae, [Monocotyledoneae, Archichlamydeae and Metachlamydeae or Sympetalae], with their more important economic species arranged after Engler & Gilg. N. P. [1916-17.] 4 photographs.

Reproductions of charts made by Mrs. Ames for the use of classes in economic botany at Harvard University, showing relationships of economic plants given in the form of family trees.

[IWASAKI, Tsounemassa. Phonzo zoufou. Index. 1, 2. Yedo. 1916?]

LANCKMAN, C. Catalogue d'une belle et riche collection de rosiers à fleurs doubles; ainsi que toutes d'arbres à fruit, plantes de bruyère, d'orangerie, et un grand nombre d'arbustes et plantes de pleine terre. Gand. 1817.

LOWE, Edward Joseph. Beautiful leaved plants. By E. J. Lowe assisted by W. Howard. London. 1864. 60 colored plates.

CONGRÈS INTERNATIONAL DE BOTANIQUE ET D'HORTICULTURE, *Paris*, 1878. Comptes rendus. Paris. 1880.

SCHWIMMER, Johann Michael. Ex physica secretiori curiositates, non minus utiles, quam jucundae. Jenae. 1672.

"A collection of very remarkable discourses on various subjects of natural history. Most remarkable is chapter vii, "Conjugium et sexus duplex vegetabilium," which proves Schwimmer to have been a very early forerunner of Linné, whose "Sponsalia plantarum" did not appear till 1746. The earliest dissertation, "De sexu plantarum," mentioned by the bibliographers is that by Camerarius, 1694, i. e., twenty-two years later than this book."

[ELLIOTT, Stephen. Botanical manuscript. 1810-14.]

This appears to be an early draft of his "Sketch of the botany of South Carolina and Georgia," which was much altered and enlarged before printing.

[————— Letters to, and other manuscripts by, Stephen Elliott. 1790-1829.]

These manuscripts together with the preceding, given to Professor C. S. Sargent many years ago, have but recently come to light and they prove to be of considerable interest. The letters comprise thirty from Henry Muhlenberg, 1808-1815, written in a very fine hand on foolscap paper, one from Zaccheus Collins, 1815, informing Elliott of Muhlenberg's death. Four are from William Darlington, 1827, twenty-four from Dr. James MacBride, one from George Arnott Walker Arnott, 1828, one from William Prince, 1828. Twenty-seven letters are from S. Boykin, F. Boie, J. Vaughan, Wm. Swainson,

Wm. Thouin, Thomas Say, Dr. Lewis Schweinitz, John Brace, and others. An interesting short letter is from John Abbot, 1817, regarding some of his drawings of insects. Several thousands of Abbot's drawings exist in Europe. The British Museum has seventeen stout quarto volumes of them all bought from Francillon, a silversmith in London, and carry Francillon's name, book stamp and printed title-pages, dated 1792-1804. There are also volumes of them in the museums of Oxford, Paris, Zurich and elsewhere.

"Lists of books for the Charleston Library demanded by Stephen Elliott, Esq.," invoices, and letters signed by F. A. Michaux, lists of plants, expense accounts, bill of lading signed by Baudry, captain of the French brig *Danurge*, 1829, and twenty-one "Proposals for publishing by subscription a work on the botany of South Carolina and Georgia, by Stephen Elliott," with signatures of subscribers, complete the collection of miscellaneous manuscripts.

In addition to the Elliott letters the Library possesses several thousand letters from various writers addressed to different members of the staff of the Arnold Arboretum. These comprise letters from many eminent botanists, from collectors during their expeditions for the Arboretum, and other important letters on botanical matters. To arrange these satisfactorily will be part of the undertaking for the coming year.

The collection of nursery catalogues is becoming an important department and an effort has been made to obtain the latest catalogues of as many firms as possible.

A large number of books were sent out as inter-library loans to Gray Herbarium, Bussey Institution, Harvard Medical School, Harvard Biological Laboratory, Harvard Forest; Harvard College, United Fruit Company, Michigan State College, University of Iowa, West Virginia University, Canada Department of Mines, Tufts College, Marine Biological Laboratory, Yale Forestry School, New York State College of Agriculture, Dartmouth College, Smithsonian Institute, Massachusetts Institute of Technology, McGill University, University of Pennsylvania, American Museum of Natural History, Antioch College, University of New Hampshire, Massachusetts State College, Texas Agricultural Experiment Station, Forest Products Laboratory, Madison, Wisconsin, University of Toronto, and Wellesley College.

In addition to loans, photostats or typewritten copies of references have frequently been made when books could not be loaned.

Fifteen books were borrowed for members of the staff from the libraries of the United States Department of Agriculture, Cornell University, Ohio State University, Harvard College, Pennsylvania Academy of Natural Science, Massachusetts Horticultural Society, and Gray Herbarium. — E. M. T.